MR. MORTON AS A FARMER.

THE OWNER OF THE LARGEST GUERNSEY HERD IN THE WORLD.

"ELLERSLIE," HIS CHARMING COUNTRY PLACE AT RHINECLIFF—ITS NATURAL BEAUTY AND PICTURESQUE SURROUNDINGS—A THOUSAND ACRES DEVOTED TO CATTLE-RAISING AND POULTRY—MILK RIGHT FROM THE COW MADE INTO BUTTER—HATCHING CHICKENS BY THE HUNDRED—SCIENTIFIC FARMING WITHIN THE REACH OF ALL.

Levi Parsons Morton, late Vice-President of the United States, has been an active figure in the National life for over a quarter of a century. He has been, and continues to be, eminent in financial circles, conspicuous in social life and distinguished in the political world. In every field he has been successful, and with such a remarkable degree of uniformity as to demonstrate, not his versatility alone, but the symmetry of his intellectual powers, and their development. Unquestionably he is a well-rounded man, a type of his class. His natural endowments, physical, mental, moral and aesthetic, are in admirable proportion; his attainments are equally harmonious. A man of affairs, who has been accustomed all his life to daily conflicts with the hard-headed sons of trade in two continents, he is also a man of thought and feeling; a politician, who has had to become familiar with the unsavory methods of the caucus and the canvass, he is none the less a statesman with broad, enlightened views, as well as a diplomat with ability to win high honors at the brilliant French capital; an acknowledged leader in the fashionable realm where he and his charming wife hold sway, he is also a plain, unpretentious tiller of the soil, as earnestly devoted to scientific farming as an agriculturist in the country, and it is his activity in this domain that forms the subject of this article.

MR. MORTON'S HOME, FROM THE LAKE.

H. M. COTTRELL, SUPERINTENDENT.

Mr. Morton has been more or less identified with rural pursuits throughout his life. He was born in the little country village of Shoreham, Vermont, and though he had to leave home for the city at an early age to begin his remarkable business career, he has never been disloyal to his early love for the pastoral scenes of boyhood. The country has been one of his chief delights and recreations, but it was not until he purchased Ellerslie half a dozen years ago that he was able to indulge to the utmost his fondness for cattle and crops, meadows and waving corn, green, flowery slopes and shady woodlands. Ellerslie is an ideal country home. Among all the magnificent estates that line the Hudson none surpass it in point of desirable location, natural beauty and picturesque surroundings. The old township of Rhinecliff, of which it forms a part, is the centre of a most interesting territory, a territory rich in historical association, famous in song and story, and replete with incidents that appeal to the imagination and stir patriotic feeling. It lies across the river from Kingston and Rondout, directly in front of the Esopus Mountains, where gold was found a few years ago in quantities that tempted the waste of a good deal of money in attempts to mine it successfully. Behind and north of the Esopus range rise the domes of the Catskills, with their wealth of legendary lore. Far north and south the eye follows the mighty river, flowing with majestic bearing to the sea, a hundred miles away, its broad expanse covered with sailing craft of all descriptions, from the stately Drew to the saucy little canoe that rashly defies the swash of the big steamers. Just where the river breaks through the Highlands, the gigantic Poughkeepsie Bridge is seen spanning the flood, and appearing in the distance like a spider's web. Great farms and mansions cluster the east bank.

Mr. Morton purchased Ellerslie from the family of the late William Kelley. It consists of about 1,000 acres fronting on the river, just south of the village, and extending back for over a mile into the more level country. Its composition, like its surroundings, is remarkably picturesque and strikingly varied. Bold eminences and deep glens, gently rising hills and smooth, green slopes, vast stretches of wild timber and broad sweeps of meadow, carefully trimmed hedges and heavy masses of strong evergreens afford endless contrast. The richness of the place in natural beauty impresses one at first glance. Only the lighter touches of artistic treatment were needed, and it is gratifying to see how fully this fact was realized by the owner. The prevailing formalisms of ornamentation, the conventional designs and statuary are almost wholly wanting. The landscape gardener's work is there, but not in an obtrusive, much less offensive, degree. Nature has not been marred, but supplemented and adorned with exquisite taste. The undulations of the land, the irregularities of the woody borders, the boldness of the eminences, the impressive swing of the outlines have been emphasized, not lessened. On the highest point of the grounds stands the family mansion, a handsome commodious structure, designed by Richard M. Hunt. It commands a magnificent view of the river and mountains and also of the farm. Sitting out on its broad piazza of a summer evening, with his Guernseys grazing in the valley below, with the commerce of the Hudson plying before his eye, surrounded by his guests and his devoted family, knowing that his store of wealth is abundant for all his needs, crowned with public honors, with health and strength unimpaired, the late presiding officer of the Senate may well feel disposed to disagree with the sentiment of good old Dr. Muhlenberg:

I would not live alway.

Outside the home area the farm is mostly devoted to hay fields, ensilage lands and pasture ranges. Nearly all other crops and planting have been abandoned, just as all other kinds of stock-raising—hogs, sheep and horses—have been given up in order that all attention may be devoted to making Ellerslie what it is, the greatest Guernsey cattle, dairy and poultry farm in the world. This statement is made advisedly. Mr. Morton's stock of 180 cows and bulls is the largest as well as the finest herd in this or any other country. Every animal is registered, and the majority were imported. The foundation of the herd was laid in 1887 by the importation of fifty-nine head, selected on the Island of Guernsey, by Mr. E. Burnett, of Southboro, Mass., and since then, by further importation, by breeding and by the purchase of the best stock to be found in this country, where the best Guernseys are now to be found, the number of the herd has been increased to its present size. This increase will continue until it reaches 400 head, the capacity of the present barn. With what success selections were made is shown by the sweeping victories won by the cattle wherever exhibited—over 100 prizes having been awarded them—their marvellous productions of milk and butter, and the apparently perfect physical health that they enjoy. But before speaking in detail about them it will be in order to say a few words about their quarters, the great barn that has just been completed, and which has caused so much comment in agricultural circles, and also to give a brief explanation of the way in which the farm is managed.

An interesting fact regarding the management is that it is vested in a college man, H. M. Cottrell, a graduate of the Kansas Agricultural College. He is the superintendent, and Mr. Morton holds him responsible for everything done about the place. He is a young man of unusual ability, and thoroughly proficient in the science of the soil. He was born on the plains and led a cowboy's life before going to college. For three years after his graduation he studies agricultural chemistry under Professor E. M. Shelton, and when he had completed this post-graduate course he was put in charge of the field and feeding experiments of the Kansas Experiment Sation. He had under his charge almost every variety of beef and dairy cattle, Jerseys, Holsteins, Shorthorns, Herefords, Angusses, Galloways, and the rest. His success there attracted attentio, and Mr. Morton, who is nothing if not progressie, decided to see how the young man could apply his scientific knowledge to everyday requirement. Accordingly he hired him; that was in Octobe, 1891, about a year and and a half ago. The marvellous strides that the Ellerslie stock farm has made since then would seem to indicate that no mistake was made in the choice of the young scientist, whose experiments are all along the lines of profit and actual usefulness. There is another college man in charge of the dairy department, W. W. Robinson, also from the Kansas Agricultural College. A third, J. E. Dorman, from the same institution, will go to Judge Hilton's Woodlawn farm next summer to supervise the butter-making there. The heads of the other departments are not college graduates, but they are thoroughly practical men. James H. Seely, who has charge of the poultry, is self-educated in the business, but his knowledge on the subject is profound and varied. He formerly owned the largest "Broiler" plant in the country at Hamilton, N. J., and came from there to Mr. Morton. Roswell Beach has charge of the crops; John Rawley is chief herdsman; B. W. Philbrick is chief engineer, and Mr. Hrrison, an Englishman by birth and training, is the gardener.

One of the first important changes Mr. Cottrell recommended was the concentration of energy upon the cattle and poultry and the abandonment of all other stock. This was done. Another improvement was the erection of a mammoth barn in place of the one that was destroyed by lightning last July. This barn is believed to be the most costly and complete ever built in the United States. All the best features of Mr. Havemeyer's and other have been incorporated in it, and it is, consquently, at the head of the list, and will be until some other ambitious stockman improves pon it. The main building is about 300 feet long, or, to speak more precisely, 297 feet, by 65 fet in width and 50 feet in height, with an L 89 by 52 feet. The structure includes besides three 500-ton silos, each 47 feet in depth, stool and engine rooms, grain bins, laboratory, bathing-rom, and ample hallways, no less than 120 ordinary stalls and forty-six box-stalls on the main flor. An equal number are placed in the basement, which is light, dry and airy, its bottom bein level on one side with the ground, while on the other side its windows open into a depressed area that can be protected by a series of trapdoors rom the inconing of snow and rain. The bay above the stalls can accommodate 400 tons of ay, without covering over the middle hallway; at the grain-rooms will hold twenty carloads. The south door, looking up through the centre of the building, is much larger than would be necessary to admit a freight train and the cars and engine would have more than ample room inside, the passage being nearly sixteen feet wide and thirty-nine feet high in the clear. The barn, which is so arranged that it can be doubled in length, will accommodate 360 head of stock, or 46 with crowding, and also house all the hay, grain and ensilage needed for this regiment of cows. The grain bin alone will hold twenty carloads, while three silos hold 500 tons each. The cows stand in two long rows in the basement and on the first floor. They are placed head to head with a side feeding alley between. Back of them are he rows of large, roomy box-stalls for calves, bls and lying-in cows.

In laying out the plans, Mr. Cottrell's work, point of hygiene, comfort or convenience seems have been overlooked. The basement, which made light and airy by a system of double walls is really a cellar, but along the sides is a trench reaching to the bottom and securely walled on the outer side. Windows run to the bottom of this trench, and thus let in light in abundance. The air is kept pure by means of box ventilators. Fastened above to the walls in front and back of the rows of cows are steel tracks on which run hanging cars. That back of the cows is for a manure car. The manure is thrown into this from the trench, and rolled out to the rear, where it is dumped into a wagon or sled, to be hauled at once to the field. The saving under this system as compared with the old plan of throwing the manure out through a hole in the wall back of each cow is apparent. The tracks in front of the cows carry cars from the silos and grain bins. The hay is stored directly over the cows. By means of slings and hay forks it can all be unloaded and mowed by steam power. Mr. Cottrell proposes also to use steam power for feeding it. Several big forkfuls pulled out of the mow and dumped in the feeding alley between the cows can be scattered into the mangers with but a few steps on the part of the feeders. The cows are secured by the Watters fire-escape device, a hanging chain that gives entire freedom of movement to the head, and makes it possible to liberate them all in a very few seconds; and they are constantly supplied with fresh water by the Buckley patent. A twenty-five horse-power engine gives ample motive force, and is supplied with steam from a separate boiler-house at a considerable distance. Another engine pumps water from a deep well, raising it in a tower to such height as to furnish a pressure of seventy pounds per inch at the barn.

Of the 180 head of cattle in the barn eighty are cows giving milk. Not one of them has been out of doors since last October. They remain in their stalls night and day, being supplied there with water as well as food. This is another of Mr. Cottrell's innovations, though not original with him, Mr. Havemyer having practised it successfully for years. The ordinary visitor naturally objects to such a system: it seems so contrary to all established notions as to the value of exercise for man and beast, but Mr. Cottrell is firm in his belief that it is the true way to handle dairy stock and defends his views with remarkable vigor and effectiveness. Whether he is right or wrong, the stubborn fact remains that the entire herd is seemingly in the healthiest possible condition, not a single case of sickness being reported in the whole herd, while the average yearly milk yield, just compiled, is no less than 6,119 3-4 pounds per cow, or about double the yield of an ordinary animal. So long as the stock has plenty of fresh air, Mr. Cottrell holds, no outdoor exercise is needed, it being, he thinks, more natural for a cow to be in a state of comparative quiescence than in an active condition. Furthermore he insists that so long as cows are kept in an artifical state, as they are in dairy work, the requisite conditions of it should be met, as he claims to have done.

"Our cows," said Mr. Cottrell, "have not been turned loose since October 15 last, and will not be turned out until they go to pasture. There is not a sick animal in the herd; they never get a chance to hook each other; they loose no milk by being exposed to storms and no feed is wasted to supply force for exercise. All our cows do is to eat, drink, sleep and give rich milk. Many people claim this is unnatural. It is and so is the giving of so much rich milk. The modern dairy cow is an artificial machine and requires artificial care and treatment to produce the highest yield. With the so-called natural treatment she would utterly fail to make the profit that makes

MIDAS, HEAD OF THE HERD.

her so much more valuable to her owner than the scrub. From 1876 to 1879 I was a cowboy and herded scrub cattle in Kansas. In early spring the feed was scarce and the cattle had to travel all day to get enough bites to make a stomachful. They were weak and thin and many died. When the grass got better they could get enough in an hour. They would eat, drink and then lie down for several hours. They fattened and did well—even under natural conditions cattle do best with little exercise. As soon as we can rearrange our crops we will keep the cows giving milk in the barn all the time, soiling them in summer and feeding ensilage in winter.

"The new barn is furnished with the Buckley watering device—every cow having a small bucket of water in her manger. Whenever she takes a drink a fresh supply of water flows in. She takes a sip whenever she feels like it, and there is scarcely a moment from 4 o'clock in the morning until midnight that some animal is not drinking. The cattle never gorge themselves with water, but take a little and often and have the water just when they want it. The water is carried in pipes through the barn to each stall, and in this way is warmed without expense to just the right temperature. The cows show the benefit of having the water in an increased yield of milk and improved appearance.

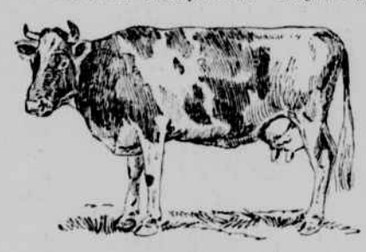
"Cows give the best flavored butter soon after calving. Milk from cows that have been giving milk for a long time never yields the best flavored butter. We breed our cows so that calves are born every week in the year. The bulk of our milk comes then at all times from fresh cows and gives us rich, delicate-flavored butter."

Ensilage is Mr. Cottrell's favorite rough food for the stock. He believes in it thoroughly. "We have found," he remarked on this point, "that good butter is made in the stable. The flavor, texture, hardness, etc., come from breed and feed. A skilled buttermaker brings this out in the butter, but it must be in the milk when it reaches the dairy or he will fail. Bran and oilmeal make soft, flavorless butter, but give large production; cornmeal makes a rich-flavored, brittle butter, with small production; cottonseed makes a hard, waxy butter. We study the tastes of our customers, and then combine these feeds so as to produce the desired quality, and at the same time secure a maximum yield. All grain fed is as sweet and pure as that used on the household table."

"Our ration for each cow per day is five pounds bran, four pounds cornmeal and one-half pound each cotton seed and linseed meals, twenty-five pounds corn ensilage and seven pounds hay. Corn ensilage is the chief rough feed, and we have found nothing equal to it. Our silos hold 1,500 tons of it. Last year, in March, our ensilage gave out. At the time we were making one pound butter to each sixteen pounds milk. We had to substitute hay, and it then took nearly twenty pounds of milk to make a pound of butter, and the cows dropped off nearly ten per cent in yield of milk. We can raise enough ensilage on an acre to feed during the winter three to five cows, and it takes two acres of the same land to produce enough hay for one cow. At the same time the milk and butter made from cows fed ensilage is better flavored than when hay is fed.

"A daily analysis is made of the skim milk and buttermilk to see that no butter is left in them. If more than a slight trace of butter is found in either an investigation is made and the trouble remedied. When this was first tried we had to make some changes, and increased our yield eight pounds butter per day from the same quantity of milk. This analysis saves us hundreds of dollars a year. The milk of each cow is weighed every milking. Twice a month we make a composite sample for analysis from eight milkings of each cow. We know then just what each cow is doing, and we are constantly working, by selection and feeding, to increase the amount of butter given by each cow. We have had special apparatus constructed so that these analyses can be made with much less labor than with that usually employed."

For Guernsey stock Mr. Cottrell shares Mr. Morton's enthusiastic admiration. It is the dairy stock of the future, he believes, and he looks forward with confidence to a signal triumph for his favorites in the stock contest which has been undertaken at the World's Fair. Five of Mr. Morton's herd have been selected for this purpose, and are now in Chicago. The Guernsey, Mr. Cottrell insists, is simply an improved Jersey. "The two breeds differ chiefly," he added, "in size, vigor, disposition and feeding habits. The milk is just about the same, no expert can tell the two apart. The Guernseys are, on the average, heavier milkers, and their milk may have a little higher color. They are heartier eaters as a rule. They average heavier than Jerseys, and never having been closely inbred or pampered, are freer from disease and more vigorous in constitution. The chief difference is in disposition. They are not



PASSAGERE.

nervous and high-strung like the Jerseys. Guernseys are the best barn dairy cattle in the world. They are perfectly at home at public shows or contests, while Jerseys are usually too excited and frightened to do their best. The Guernseys can be shipped and handled easier and have a greater capacity for turning food into milk when fed in a barn.

Of the stock in the barn Midas, 2,003, the king of the herd, attracts most attention. He is a five-year-old, and is pronounced by many experts to be the finest Guernsey bull in the world. His large, well-rounded body, straight back, broad loins, fine head, well-set eyes, deep, rich yellow horns and skin combine to give him a perfect form. His disposition is so mild that a child can lead him. Besides being a grand individual he traces back on both sire and dam's sides to noted butter Guernseys. His dam, imported Belle Lucie 2d, 3,655, is an attractive cow with well-shaped body and good udder, and has given, under light feeding, 6,434 pounds milk in eleven and a half months. She traces to Squire of Les Vauxbelets, 35 F. S., the most renowned show-yard winner in the Guernsey breed, and to Squire of St. Andrews, 73 F. S., winner of silver medal at Paris, 1856. As a yearling Midas won first prize at the Buffalo International, Dutchess County and Bay State Fairs in 1889, and second prize in the New-York State Fair that year. He also headed the first prize herd at the New-York and Bay State Fairs in 1889, and in addition, won the sweepstakes at Buffalo as best bull of any age. Midas has thirty-six prize winners among his ancestors.

Safeguard, 1,790, another fine bull, hardly less famous than Midas, stands near the monarch, but attracts less attention. There is also a number of promising young bulls of various ages.

The belle of the stable is Beautaitrice 4th, 3,657, declared in the Bay State Fair Report to be "one of the best and most typical Guernsey cows that ever lived." A model of her kind, and with her huge udder, large tortuous milk veins, and well-sprung ribs, appears to be what she is, an enormous milker. She was exhibited in 1888, at the Buffalo International, New-York, State, Dutchess County and Bay State fairs, where, notwithstanding the fact that she had been in milk since February 10 previous, she was awarded first prize in every instance. She has given 1,667 3-4 pounds of milk in a month and 6,464 1-2 pounds in ten months, and 2 3-4 pounds of butter in a day on regular rations. Like Midas, she traces to the famous show bull and stockgetter, Squire of Les Vauxbelets. She was selected for the World's Fair, but did not calve at the right time to enable her to be sent.

Passagere 2d, 1,528, is a fine large cow, and the champion milk yielder this year, giving 10,316 pounds (over five tons), of milk during the last twelve months, and 1,288 1-2 pounds more than her own weight in thirty days. She was imported by J. W. Fuller. An offer of $800 for her was refused.

DISS IIID.

The picture of Diss 3d, 3,664, appears above. She is a fine cow with a model udder. She has given 7,133 1-2 pounds of milk in a year.

Chamoinesse 2d, 3,661, whose picture is also given, is another of the lot imported by Mr. Morton. She is lemon fawn and white in color, with a rich yellow skin, and has, as will be perceived, almost an ideal dairy form, wedge-shaped, with large space for digestion, a capacious udder,

CHAMOINESSE IID.

and plenty of room to make it comfortable. She gives from 700 to 800 pounds of milk per month on her regular herd ration.

The record of the sixty-two cows and heifers that have completed the season's work has just been compiled. It is an interesting exhibit. The average yield as stated is 6,119 3-4 pounds of milk in a year, the highest being Passagerta, 10,316 pounds. Eight cows produced over 8,000 pounds, fifteen over 7,000 pounds, thirty-three over 6,000 pounds. The yearly average of butter is one pound from a little less than seventeen pounds of the mixed milk of the whole herd. The cows have never been forced, but are given what grain they are able profitably to turn into butter. A composite sample of the mixed milk of the whole herd for eight milkings, just analyzed by Professor Cooke, of the Vermont Experiment Station, shows 5.37 per cent fat, 3.06 per cent casein and 15.18 per cent total solids. Forty-two per cent of the milk is from cows that have calved within the last three months.

Aside from the few bull calves that are sold from time to time, the sole market product of the herd is butter, and butter-making at Ellerslie is a most important department and a most interesting sight. Between seventy-five and one hundred pounds are sent to this city daily. Most of it is taken by the Windsor Hotel, the Union League and some other large clubs. To witness its manufacture under the experienced eye and scientific direction of Mr. Robison is to have one's ideas on the subject completely revolutionized.

The milk, as soon as it is taken from the cows, is carried to the dairy. Cold air, taken from outdoors so as to be perfectly pure, is forced into the bottom of the cans holding the milk by a Hill's aerator. This air rises through the milk and carries out every particle of animal odor in it. The pumping is continued from one to three minutes or until the air that comes from the milk is absolutely odorless. The milk as it comes from the cow has a temperature of about ninety-eight degrees. The aerating reduces it about ten degrees. It is then run through a De Laval separator and the cream taken off. The separator is simply a large steel bowl set in a suitable frame. This bowl revolves 8,500 times in a minute, the outside travelling about two and a half miles a minute. The milk runs to the center of the bowl and the centrifugal force throws it to the outside. The skim milk, being the heavier, is thrown clear to the outside and the lighter cream has to go nearer the middle. In this way one is separated from the other and the cream can be taken from 1,200 pounds of milk in an hour. The cream is taken from the separator and immediately run over a Star cooler which reduces the temperature from eighty-six to thirty-eight degrees. It is churned at thirty-eight degrees in summer and forty-two degrees in winter in a Diamond churn. This consists of a diamond-shaped box, supported and revolved upon trunions, and having its interior divided into two equilateral triangles by a movable centre board, which separates the cream in equal parts and produces a balance at all points in its revolution, illustrating the liquid-balance principle.

But the most interesting feature of the Ellerslie dairy is not the mechanical contrivances or analytical instruments, but the new process resulting in the immediate production of butter from the warm milk instead of from the cold cream, as formerly. This is another of Mr. Cottrell's improvements, and one in which he takes great pride. He explained the discovery of it at length. "Ripened cream butter was made," said he, "from the time the dairy was started. The cream was kept from thirty-six to forty-eight hours at a high temperature until a certain degree of acidity was developed, when it was cooled to 60 degrees and churned. This is the ordinary way of making butter. Early in 1892 a trial was made with a machine to produce butter directly from the new milk. The butter made in this way had a very different flavor from that made by the old method. Samples were sent to each of our customers with the request that they try it side by side with that made by the old process and report. With a single exception every customer wanted butter by the new method. We went to work making butter with the machine, but it did not take all the butter out of the milk. The loss was about 7 per cent, and we had to devise some way to make the quality of butter demanded by our customers and at the same time save all the butter. We ran the milk through the separator, cooled the cream immediately to 60 degrees and churned it. The buttermilk from this churning was analyzed and showed about 3 per cent butter—as much as is found in ordinary city milk. We tried again, cooling the cream to 50 degrees, and the buttermilk showed considerably less loss in butter. We were on the right track. We kept reducing the temperature, every reduction showing a corresponding reduction in amount of butter lost in the buttermilk until a temperature of 38 degrees was reached, when the buttermilk showed only a faint trace of butter, usually less than 1-20 of 1 per cent. Throughout the summer we churned at 36 to 40 degrees. After the cattle were put in the stable and given dry feed we found it necessary to raise the churning temperature to 4 degrees."

"Most of our customers use the sweet-cream butter. For them the cream is taken directly from the cooler and churned. By this process the butter in the milk that comes from the cows in the morning is ready for the table at noon, and we have had butter on table in the evening in New-York—ninety miles away—made from milk given by our cows on the same day. For such of our customers as prefer butter made by the old process we take the cream from the cooler and handle it in the usual way. Some of our butter is sold unsalted, some has half an ounce of salt to one pound of butter, and some one and a quarter ounces of salt to one pound of butter. We make just what our customers demand."

This manufacture of butter from sweet cream has caused a good deal of controversial writing in the dairy papers, as might be expected, and the Ellerslie people have been called upon to defend and explain their methods. They are ready to do so at all times. The main trouble, Mr. Robison says, that people have in churning cream sweet is that they put the cream into the churn, like they would do with ripe cream, and do not pay any more attention to it; second, one needs to have a thermometer for a guide.

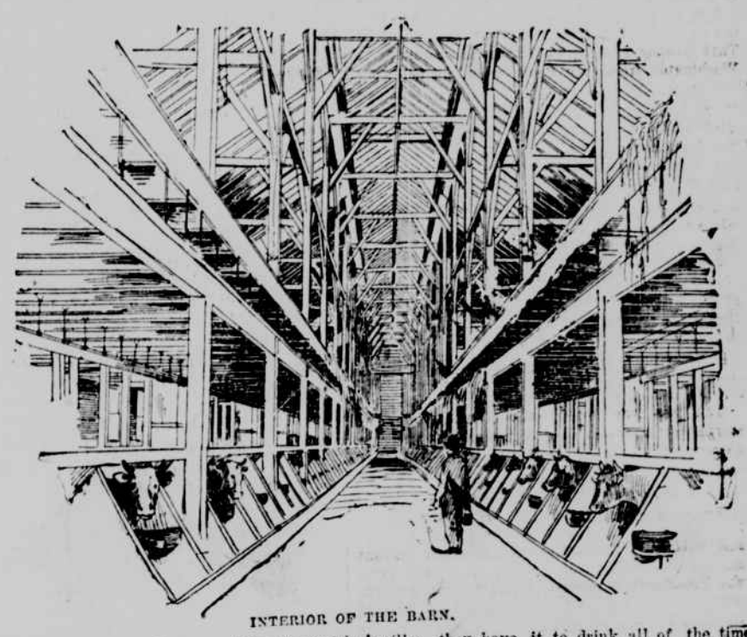
The poultry department, or rather the "broiler factory," for that is really what it is, remains to be noticed. This consists of a group of buildings from which are sent to market each week about 500 artificially incubated chickens, that is, between 20,000 and 25,000 a year. Ten incubators, Prairie State and Pineland, are kept in constant use, and all the desirable eggs that can be bought in the neighborhood are consigned to the developing care of these inventions. About half the eggs put in hatch out alive. About 20 per cent are found clear and therefore unfertile on candling four days after starting. Three-fourths of the chicks go safely through the brooders and are sold as broilers at eight to fourteen weeks from hatching, weighing when ready for market about one and a half pounds. The brooding arrangement is very simple. It consists merely of a pen, five by fifteen feet, across which, near one end, run four inch-and-a-half hot-water pipes covered with a board and screened on each side by a flannel curtain. Forty-eight of these pens are arranged in an L-shaped building, 168 feet long one way and 108 feet the other; and, as each pen accommodates 100 voracious little chicks—which pass from pen to pen as they grow, the height of the top board of the brooder varying from four and a half inches for the babies up to a foot for the graduating class—the animation of the scene may be imagined. It is intended to breed poultry largely, as well as to hatch it, keeping white breeds exclusively. It is thought that by crossing white Plymouth Rock cocks on white Minorca hens, whose eggs are particularly large, white and attractive, a select trade in "fancy" eggs may readily be acquired.

Mr. Seely, the head of this department, is a man of decided views and these are not always in accord with those of other poultrymen. For example he takes issue squarely with Mr. Gaylor, who is in charge of the poultry at Judge Hilton's Woodlawn Farm, and who expressed in The Tribune recently in favor of Indian Games as the best fowl for farmers. "I do not agree with Mr. Gaylor on this point," remarked Mr. Seely. "I do not believe that the Indian is the best all-around fowl. I admit that they possess good qualities but they are not the best for the general farmer. I prefer the White Minorca to Leghorn on account of the larger size of fowl and the much finer egg. I prefer one or two breeds kept for practical results to a large number of breeds, many of them merely show birds. My two breeds, I feel, to be the best all-around fowls for practical use in the country.

"We have," continued Mr. Seely, "ten incubators of 300 eggs each: five of Pineland and five Prairie State. I prefer the Pineland. I think it will hatch out stronger chickens. We need 4,000 eggs a month to keep the incubators running. These eggs are purchased from farmers around here. We have brooder capacity for 5,000 chicks at one time which we propose to turn over every ten weeks or thereabouts. At present we have about 4,000 chicks and we are killing them as fast as they reach market size. For hens we have a few White Minorcas; the balance are scrubs crossed with White Plymouth Rock roosters. We have a few White Holland turkeys of first-class stock. We have a few very fine Pekin ducks and these with fantail pigeons and peacocks complete our stock.

"We propose in future to raise our own eggs, as eggs which we have been able to get do not hatch well, besides taking so much longer to mature. It takes twelve weeks to get them up to market size. The breeds that we propose to use will reach that size in eight to ten weeks, beside being of better quality. We intend to use the White Minorca for eggs on account of its size and color and the size and color of the eggs. For incubators we will cross them with White Plymouth Rock roosters. Our reason for crossing is that the Minorca is a non-sitter, but a good layer, and when crossed with White Plymouth Rock they do not feather as fast, giving more strength to the chick which enables it to mature quicker and makes a better broiler. These two breeds whether crossed or pure are hard to beat as an all-purpose fowl.

"As fast as we can raise the Minorca hens we propose to work into a fancy egg trade. A gentleman who was here a few days ago, offered to take



INTERIOR OF THE BARN.

2,000 eggs a day the year around at prices that to most people would seem fabulous. We are not after the show room so much as we are for profit, and propose to keep only these two breeds and have them of the best. We have, as I said, a limited number of Pekin ducks of the best strain that we could buy and propose with these to raise our stock for next year. We shall try and raise about 5,000 and sell them at about ten weeks old. There is as much money in ducks as broilers if properly handled."

"In turkeys we selected the White Holland on account of their color, besides they are so domestic. They will go in with the hens to roost, and lay their eggs in the same nest with the hens. This enables us to have some control of their eggs as well as their young. This year we will only try to increase our stock, which is limited.

"We feed generously and in great variety, such as cornmeal, bran middlings, cottonseed meal, cracked corn, cracked wheat, oatmeal, ground meat and bones, and cabbage. All our feed is of the best quality that we can get, and such as any one would use on his own table. We believe it is the feed and not the breed that makes the flavor of the meat. As proof of this our broilers are all scrub stock, and yet experts have pronounced them equal to partridges in flavor. In preparing for market all our chicks are dry picked, and then put into cold water until thoroughly cooled before shipping, and in warm weather we put ice in the package to keep them cool.

"I might add that I use a great deal of skim-milk; they have it to drink all of the time, I get it within an hour after it is milked, and while yet warm. The chicks are very fond of it, and I think it will pay better than to feed it to pigs, which bring 6 or 7 cents per pound, while chicks bring 25 cents to 40 cents. I use a little plaster on and under the brooders; it makes them smell sweet. I also use considerable hayseed and chaff in the pens, as it keeps the chickens busy, besides they eat leaves and seed, which does them no harm."

When the inspection of the various departments had been made, and a four of the farm completed the April sun had passed the meridian and the afternoon was far spent. The train for New-York would be along in half an hour. While awaiting its arrival the visitor put a few practical questions to the young superintendent.

"This is a most interesting place, but can farmers with small means—by that I mean the great majority of the tillers of our soil—who are not able to buy blooded stock, adopt the methods you employ here at Ellerslie?"

Mr. Cottrell meditated for a moment, and replied: "It depends on the man. A scrub man needs scrub stock and scrub methods of farming. The very first thing a farmer has to do is to improve himself. Then he can go to work on his cattle and crops. It is the everlasting thinking about the business and the putting the thoughts into practice that makes the difference between success and failure in farming.

"Suppose a young man decides to go into dairying. The first question is, what breed shall he take? He finds that Mr. Morton is making a great success with Guernseys. Mr. Wilbur will have nothing but Holsteins, and another breeder Ayrshires. Why? Simply because the peculiar characteristics of the milk of each of these breeds is adapted to the special use made of it by the owner. Mr. Morton sells butter alone. He wants milk with the greatest possible amount of butter and the least amount of casein. Guernsey milk is rich in butter and deficient in casein. It costs money for feed to produce casein, and the less there is in the milk for butter the more profit. Suppose he sold milk to invalids. He wouldn't keep Guernseys. The butter globules in Guernsey milk are large and separate easily from the rest of the milk, and in a few hours we have a very rich cream and a very thin skim-milk. The Ayrshire butter globules are small and do not separate readily. The milk is more in the condition of an emulsion—just the condition demanded by weak stomachs. The young man ought to know this when he selects his breed.

"After the selection of the breed comes feeding. If he makes butter, flavor comes first. He finds certain feeds make rich flavored butter, some feeds soft butter, others butter that is hard and brittle, and still others hard, waxy butter. If he adopts certain combinations of feed he can make butter too hard to spread, another combination will make it soft and oily. No two markets demand exactly the same quality of butter, and he must study the tastes of his consumers and feed to meet them.

"Besides producing flavor he must feed to get good yields and make money, he must feed to keep his cows in good health, and he must feed his cows so they will have strong, vigorous calves. If a cow is fed well this year she will give more milk on account of it next year. How far is it profitable to go in this direction? Suppose the breed and feed are all right. There are the thousand questions that come up in butter-making, and every little change makes a loss or profit.

"All this takes thinking, thinking, and the more he knows before thinking the better the ideas will be. We must know what others are doing. Less than a month ago I picked up some information in one of the farm papers that has already saved us $400, and yet I often meet farmers who say it does not pay them to read.

"It is just the same with other branches of farming as with dairying. Look at the laws of chemistry and biology affecting the production of ensilage. How many questions of physics and chemistry come up in tillage—the mechanical and chemical effects of plowing, the action of freezing in fall ploughing and how to use it, the effect of cultivation on capillary action and how to use it to make money?

"All this requires knowledge to use understandingly. A man without education can train himself to think and can slowly discover the facts himself, but a good agricultural education is a great help. I think this training can best be secured through some of our agricultural colleges. They not only give a young man the education he wants, but, better, they train him to think, and think in the right way. I have always had charge of men doing farm work, and for the past five years have employed each year 200 men or more. Every year I have had college students working side by side with ordinary farm workmen, and have invariably found that the students have been my best help. They do more and better work than stronger uneducated men. We have had several students at Ellerslie from the Kansas Agricultural College, and last year one of our best men was from the agricultural department of Cornell.

"It is the extra pound of milk a cow gives, the extra per cent of butter in the milk, the little bit of extra care in keeping the milk pure and sweet, and the little extra attention in saving all the butter in churning that gives the better product and the higher prices. Men must think to secure this."

"You believe that it pays any farmer to keep blooded stock?"

"Of course I do. But here comes your train."